

F/G 8/3

NG E--ETC (11)

NL

END
DATE
FILMED
9-81
DTIC

AD A102094

DTIC FILE COPY

SURFACE CURRENTS

WEST CENTRAL NORTH ATLANTIC OCEAN

INCLUDING EAST COAST OF THE UNITED STATES



FEBRUARY 1978

Reprinted 1981

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

NAVAL OCEANOGRAPHIC OFFICE
NSTL STATION, MISSISSIPPI 39462

NOO SP 1400—NA 6✓

12

E CURRENTS

NORTH ATLANTIC OCEAN
EAST OF THE UNITED STATES



LEVEL II

DTIC
ELECTE
JUL 28 1981
S D
E

81 7 24 032

FEBRUARY 1978

Reprinted 1981

RELEASE; DISTRIBUTION UNLIMITED.

HYDROGRAPHIC OFFICE
PENSACOLA, MISSISSIPPI 39522

2

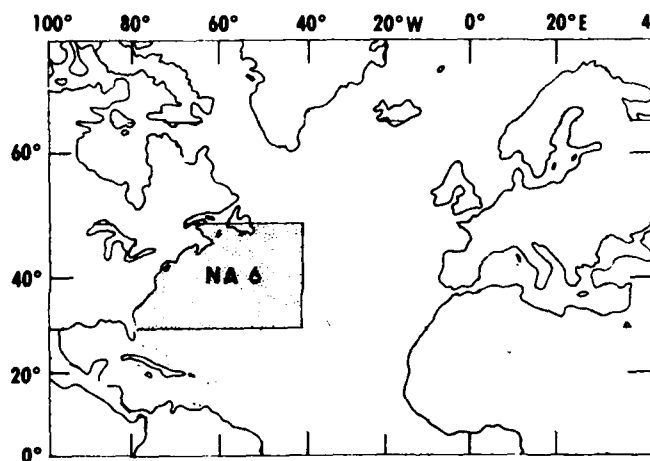
ABSTRACT

THIS ATLAS, AND THE SERIES OF WHICH IT IS A PART, IS COMPUTER GENERATED AND AUTOMATICALLY PLOTTED. IT MAKES AVAILABLE TO THE USER THE MOST RECENT SURFACE CURRENT DATA COLLECTED AND WILL BE UPDATED WHENEVER SUFFICIENT AMOUNTS OF DATA ARE ADDED TO THE DATA FILE. THIS AND THE OTHER ATLASES ARE BASED ON A VAST QUANTITY OF DATA AS COMPARED TO THE PREVIOUS MANUALLY-COMPILED EDITIONS PRINTED IN THE MID-THIRTIES.

THE SURFACE CURRENT INFORMATION IS BASED MAINLY ON SHIP DRIFT, WHICH IS THE DIFFERENCE BETWEEN THE DEAD RECKONING POSITION AND THE POSITION DETERMINED BY ANY TYPE OF NAVIGATIONAL FIX. THIS DIFFERENCE DESCRIBES THE DIRECTION AND SPEED OF THE CURRENT.

NAVAL OCEANOGRAPHIC OFFICE S

SURFACE CURRENT
WEST CENTRAL NORTH ATLANTIC
INCLUDING EAST COAST OF THE UN



9 Final report.

11 FEB 1978
REPRINTED 1981



APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLI

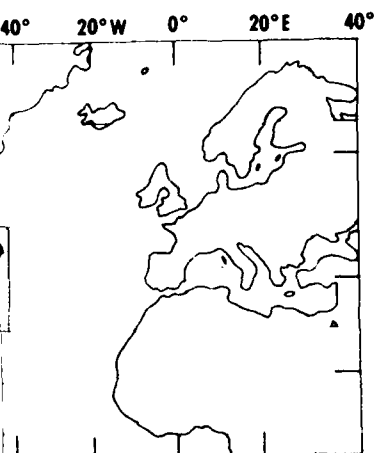
DEPARTMENT OF THE NAVY
NSTL STATION, MISSISSIPPI 3952

GRAPHIC OFFICE SPECIAL PUBLICATION 1400—NA 6

CURRENTS

19
New P-1-1A-1A-6

NORTH ATLANTIC OCEAN EAST OF THE UNITED STATES.



Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	

778

12 24
DATED 1981



PLEASE, DISTRIBUTION UNLIMITED.

DEPARTMENT OF THE NAVY
MISSISSIPPI 39522

2
350120

ACKNOWLEDGMENTS


Messrs. Raymond J. Beauchesne* and William E. Boisvert made major contributions to this atlas.

*Mr. Beauchesne presently is employed by the Bureau of Naval Personnel.

FOREWORD

THIS ATLAS, ONE IN A SERIES OF 43 REGIONAL SURFACE CURRENT ATLASES, IS PRODUCED TO FULFILL A NEED OF NAVY PLANNING STAFFS AND THE SCIENTIFIC AND INDUSTRIAL COMMUNITIES FOR THE LATEST AVAILABLE OCEAN SURFACE CURRENT DATA. THESE ATLASES ADD TO THE WEALTH OF NAUTICAL INFORMATION UPON WHICH OPERATIONAL PLANNING, NAVIGATIONAL SAFETY, AND SHIPPING ECONOMY DEPEND. RAPID PRODUCTION AND WIDE DISSEMINATION OF THIS ATLAS ARE MADE POSSIBLE BY THE LATEST COMPUTER TECHNIQUES.

THE CONSTANT IMPROVEMENT IN THE QUALITY OF SURFACE CURRENT DATA RECEIVED OVER THE YEARS IS MADE POSSIBLE LARGELY BY THE MORE THOROUGH REPORTS OF VOLUNTARY OBSERVERS IN RECENT YEARS. THE DEFENSE MAPPING AGENCY, THE OCEANOGRAPHIC OFFICE, AND THE USER OF THE ATLASES RELY ON THE PERSONAL OBSERVATIONS OF THE MAN WHO HAS "BEEN THERE." MARINERS, IN REPORTING THEIR OBSERVATIONS, RENDER A SERVICE NOT ONLY TO THEMSELVES BUT ALSO TO ALL "WHO GO DOWN TO THE SEA IN SHIPS." WITH THE ADVENT OF NUCLEAR POWER, ELECTRONIC NAVIGATION AIDS, AND 300,000-TON SHIPS, UP-TO-DATE, RAPIDLY DISSEMINATED ENVIRONMENTAL AND NAVIGATIONAL INFORMATION HAS BECOME INCREASINGLY IMPORTANT.


JOHN R. McDONNELL
Captain, U.S. Navy
Commander

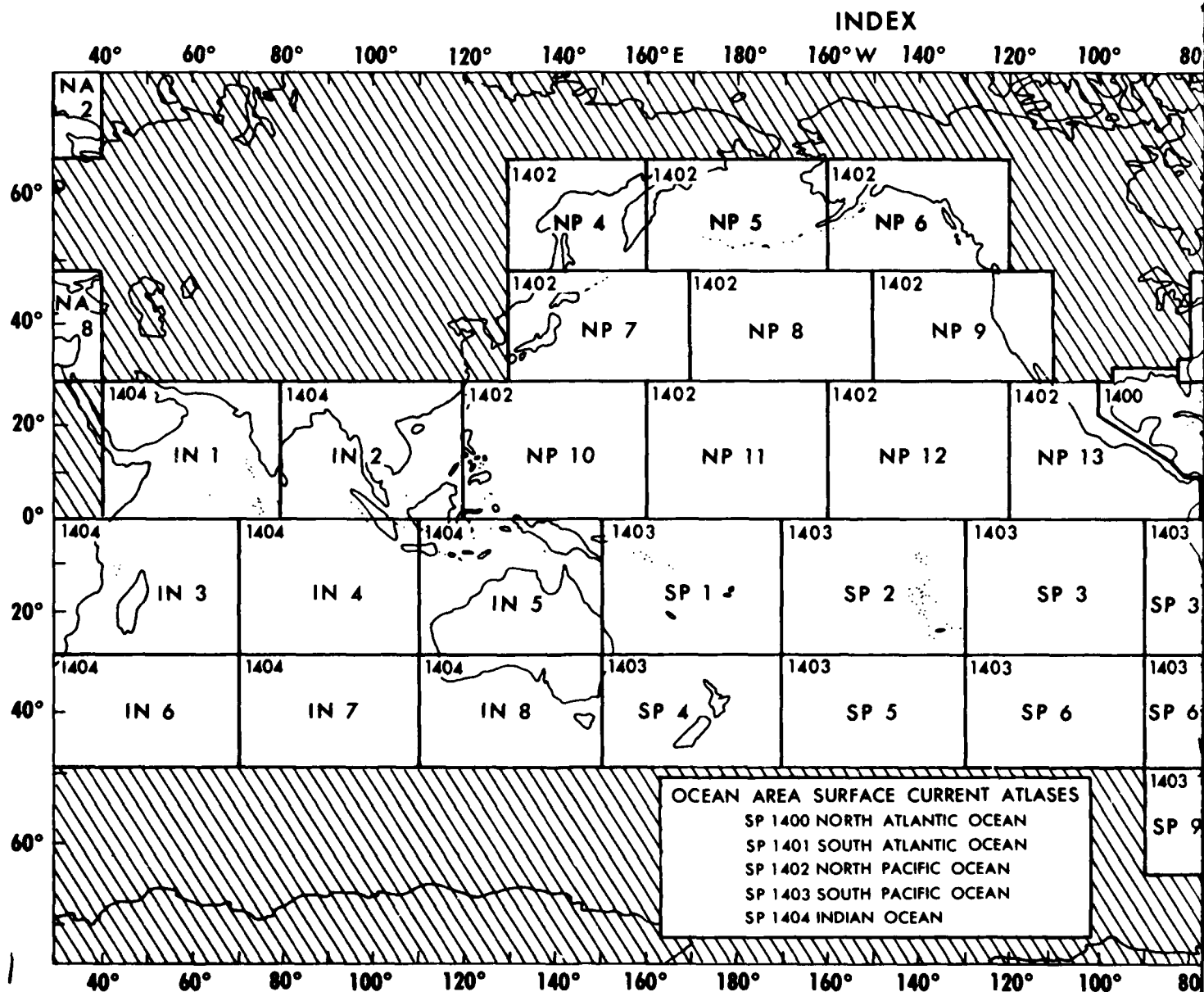
SURFACE CURRENT ATLASES

THIS SERIES OF COMPUTERIZED ATLASES REPLACES THE OLD HYDROGRAPHIC OFFICE ATLASES OF SURFACE CURRENTS (HOP 566, 568, 569, 570) WHICH WERE MANUALLY COMPILED FROM DATA OBTAINED DURING THE PERIOD 1903 - 1934. THESE NEW ATLASES CONFORM TO THE STANDARD NAVY OCEAN AREA AND REGION INDEX LIMITS SHOWN BELOW: e.g., NOO SP 1402-NP 10 COVERS NORTH PACIFIC REGION 10 EAST OF THE PHILIPPINES.

AS AMOUNTS OF NEW DATA WARE

THESE GRAPHICS MAY NOT BE USED IN AREAS AS THE NORTH SEA, PEARL CURRENTS ARE STRONGLY TIDAL, PREDICTABLE HOURLY CHANGES

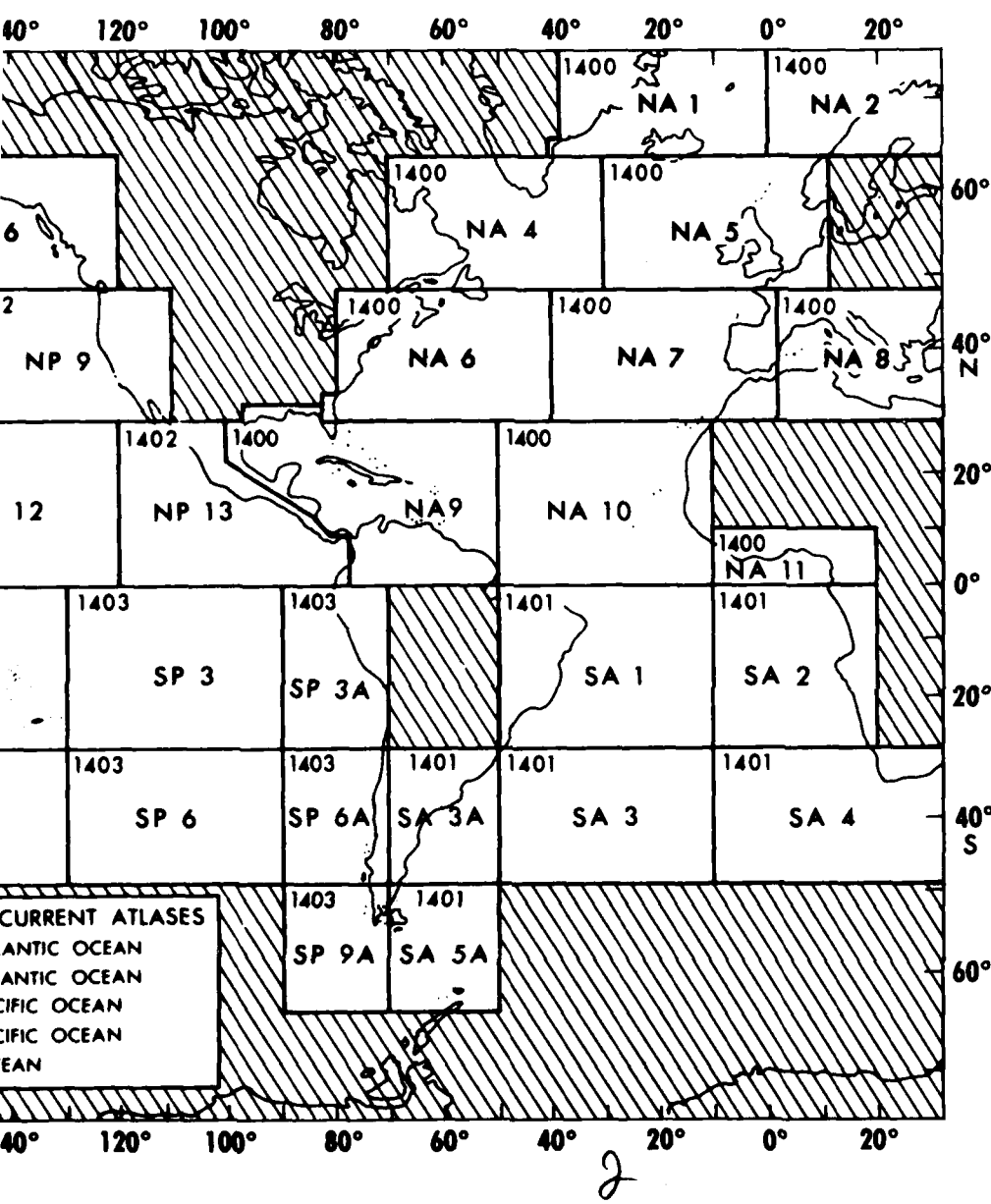
RECENT IMPROVEMENTS IN THE DATA FILE ASSURE THE INCLUSION OF THE LATEST, HIGH QUALITY SURFACE CURRENT DATA AVAILABLE. THE FILE NOW CONTAINS MORE THAN 4,200,000 OBSERVATIONS AND A GENERAL UPDATE OF THE FILE WILL BE MADE



NT ATLASES

AS AMOUNTS OF NEW DATA WARRANT, MOST LIKELY EVERY 12 - 18 MONTHS.

THESE GRAPHICS MAY NOT BE TRULY REPRESENTATIVE OF THE ACTUAL FLOW IN SUCH AREAS AS THE NORTH SEA, PERSIAN GULF, GULF OF THAILAND, AND YELLOW SEA WHERE CURRENTS ARE STRONGLY TIDAL. FOR SUCH AREAS, OTHER SOURCES DESCRIBING PREDICTABLE HOURLY CHANGES OF TIDAL CURRENTS SHOULD BE CONSULTED.



Introduction

The Surface Current Data File, from which these atlases are derived, consists primarily of over four million ship set and drift observations. These data were collected by the Netherlands, Japan, Britain, France, and the United States. The file is supplemented by several thousand Geomagnetic Electrokinetograph (GEK) observations, mostly Japanese. The file spans the period from the early 1850's to the present. The earliest observations were collected by the Netherlands and Great Britain; those of the 1960's through the present are primarily United States data.

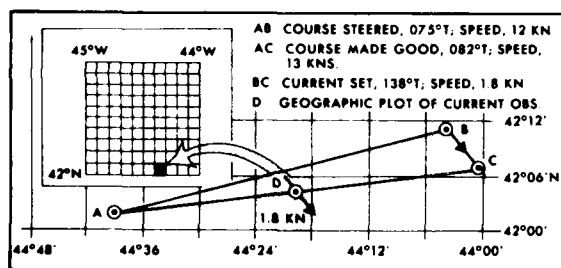
General Quality

The quality of this data file is considered high for this type of derived value. The data have been carefully screened for duplication; observations taken under adverse conditions (i.e. high winds and waves, time between observations greater than 12 hours) have been eliminated when warranted. Consideration was given to the reliability of the observer; doubtful shipboard computations of set and drift were edited; and observations with erroneous locations (mostly observations on land) have been eliminated. The accepted data are considered most useful when used collectively as in summaries where a number of observations show trends.

General Observation Technique

The set (direction) and drift (speed) are computed by the navigator from the difference between the dead reckoning (DR) position and the position determined by any type of navigational fix. The drift can be determined along any straight line track and includes all factors which cause changes in the DR position. When a fix is obtained, the current set (direction) is FROM the DR position TO the fix; the drift (speed) is equal to the distance in nautical miles between the DR and the fix, divided by the number of hours since the last fix. For successive observations, the TO POSITION of one observation becomes the FROM POSITION of the next observation.

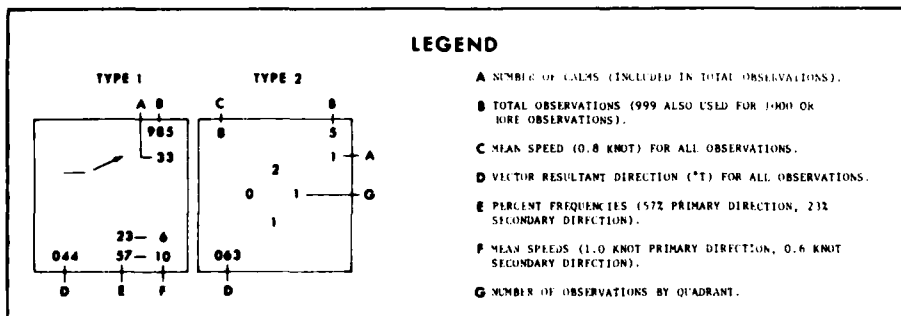
Because the influence of current may vary along a ship's track, the MEAN POSITION of the track is assigned as the geographic location of the current observation. An example of a current computation is shown in the figure below.



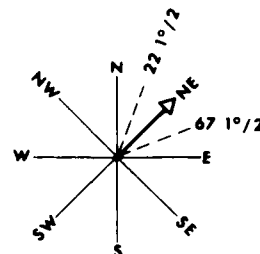
EXAMPLE OF A SURFACE CURRENT (SHIP'S DRIFT) OBSERVATION

Data Presentation

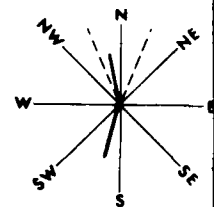
The following legend shows two types of surface current presentations by 1° quadrangle, type 1 with 12 or more observations and type 2 with fewer than 12 observations. Where there are 11 or fewer observations within a 1° quadrangle, the total number of observations is shown within the 90° quadrant containing the observations.



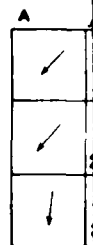
If there are 12 or more observations, the vector resultant is shown by vector resultants as follows:



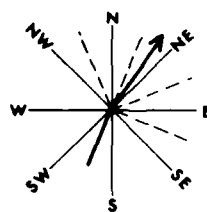
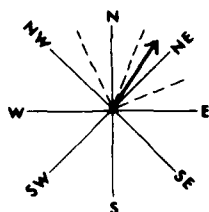
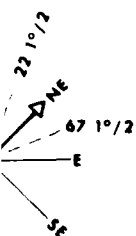
- (1) Persistent Current - 60 percent or more of all observations fall within a 45° sector of the 8-point compass.



- (4) Bizonal Flow - Practically all observations are concentrated in opposite pairs of sectors, and one pair contains at least 80 percent as many observations as the other pair. This generally indicates that occurs in zones of entrained opposing currents (see examples of quadrangles 1, 2, and 3).



If there are 12 or more observations in a 1° quadrangle, the surface current is depicted by vector resultants as follows:



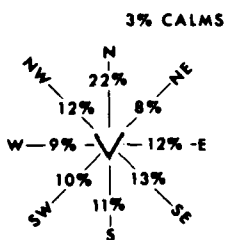
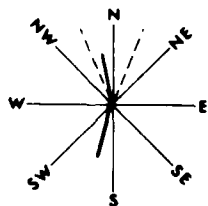
- 60 percent or more of all within a 45° sector pass.

(2) Prevailing Current - 70 percent or more of all observations fall within two adjacent 45° sectors.

(3) Primary Current with Secondary Direction -

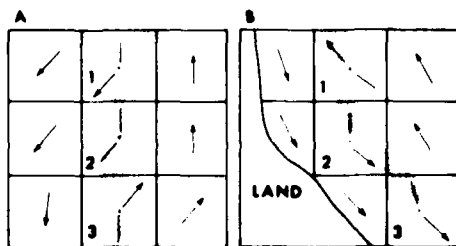
(a) Primary Current - 50 percent or more of all observations fall within three adjacent 45° sectors.

(b) Secondary Direction - 20 percent or more of all observations fall within a 45° sector, and the two resultant vector directions are separated by more than 90° of arc.

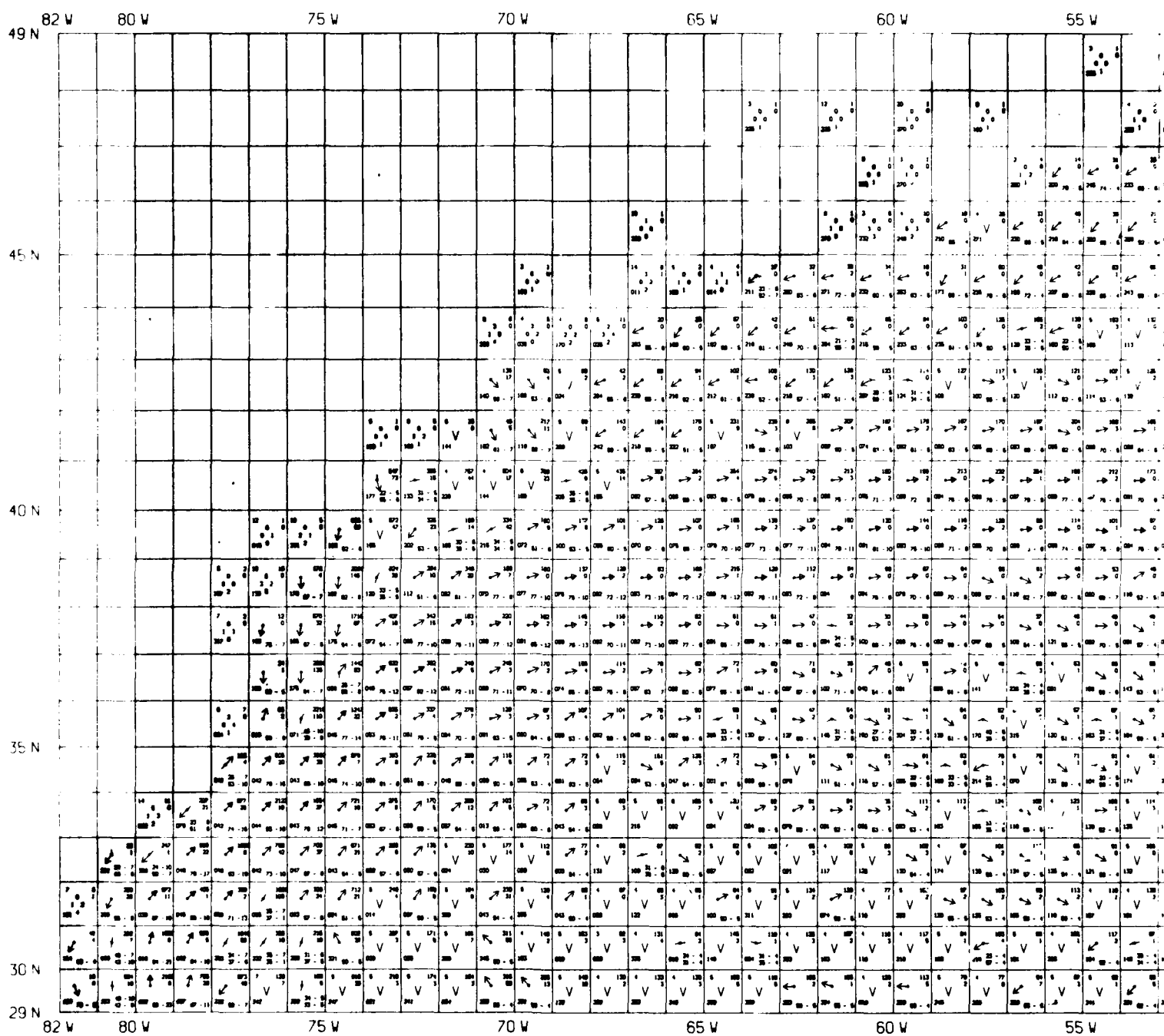


Bizonal Flow - Practically all observations are concentrated in opposite pairs of 45° sectors, and one pair contains at least 80 percent as many observations as the opposite pair. This generally indicates variability that occurs in zones of entrainment between opposing currents (see examples A and B, quadrangles 1, 2, and 3).

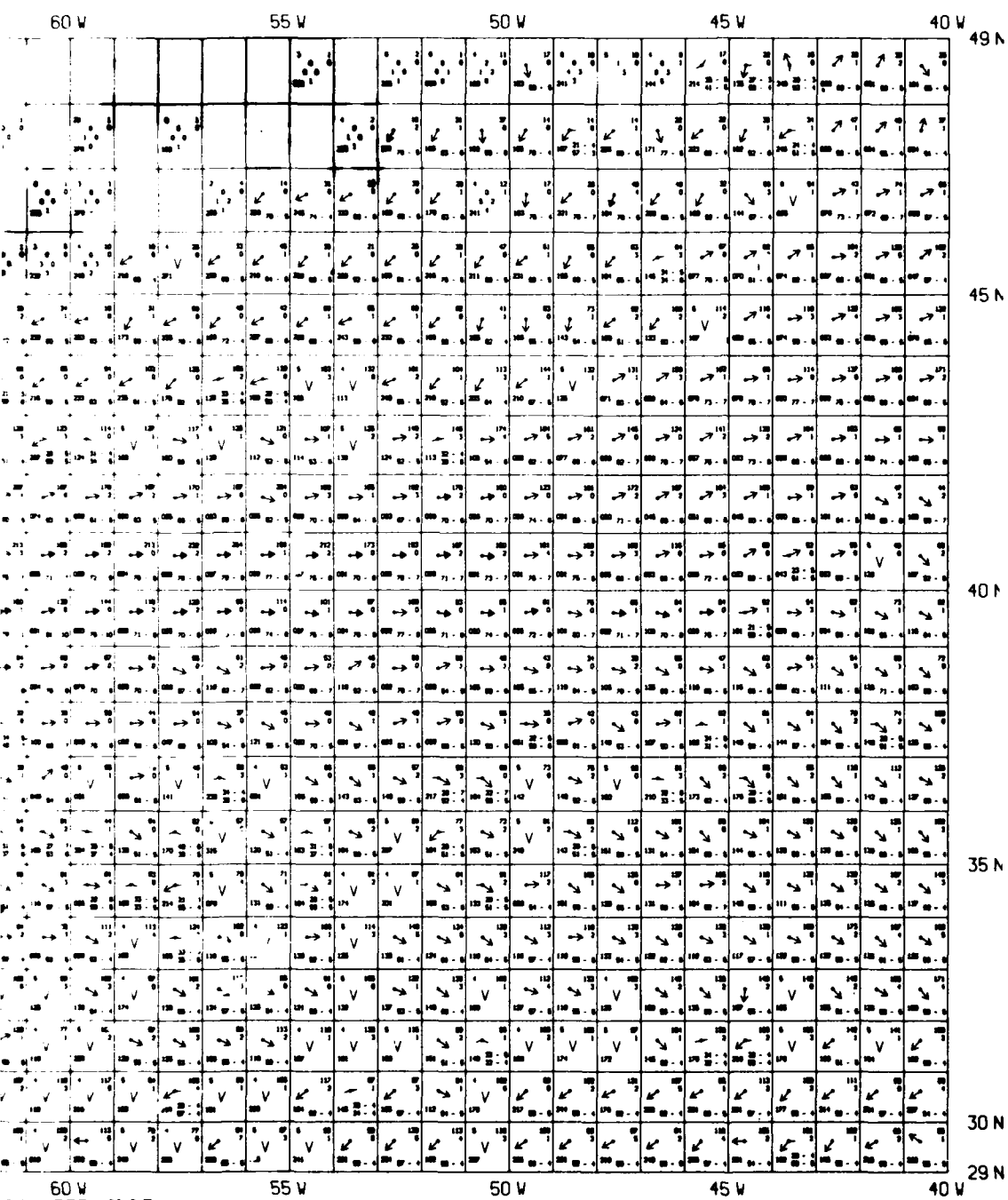
(5) Variable Current - The 45° sector with most observations has less than 25 percent of all observations; direction is indeterminate.



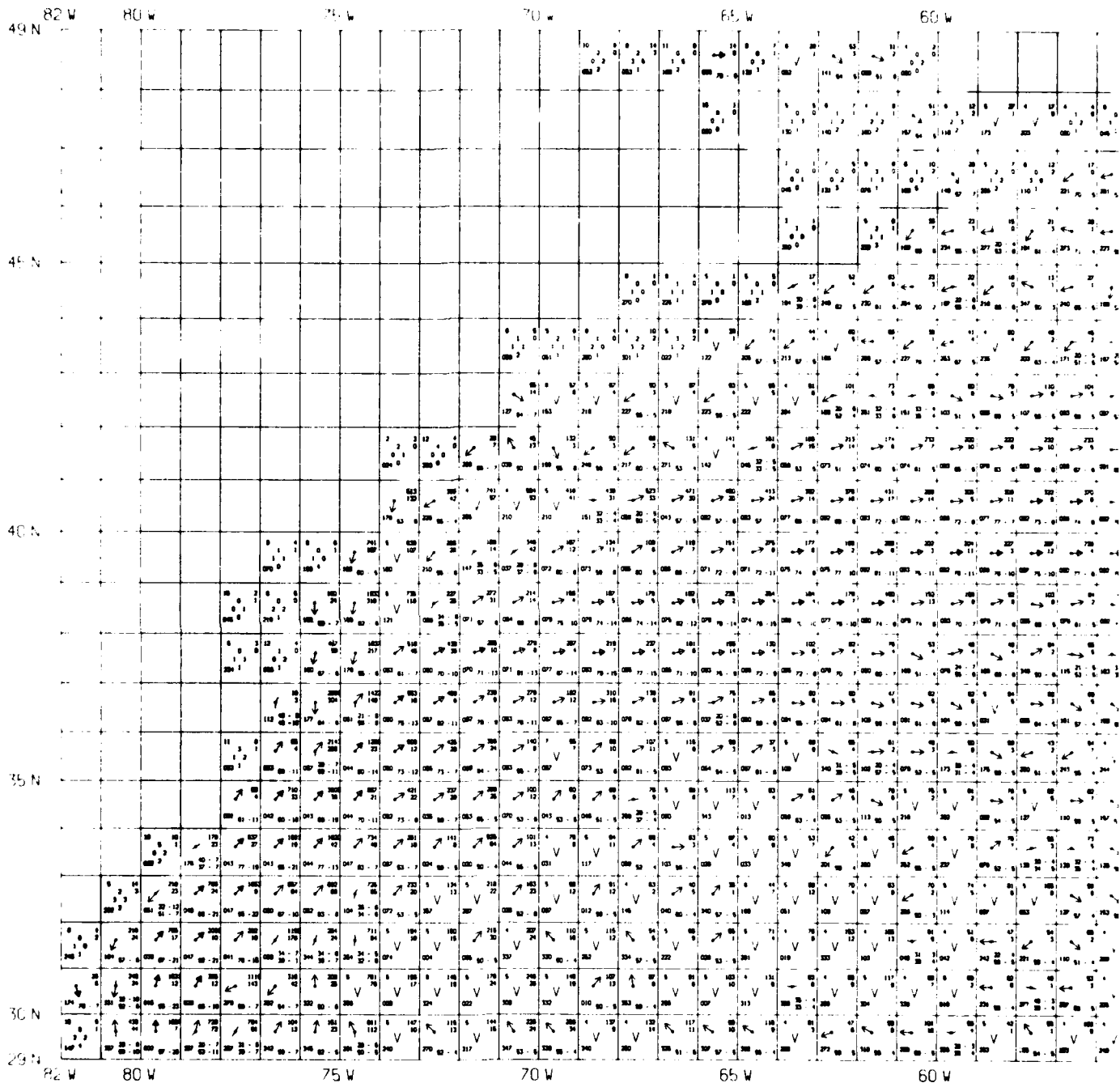
2



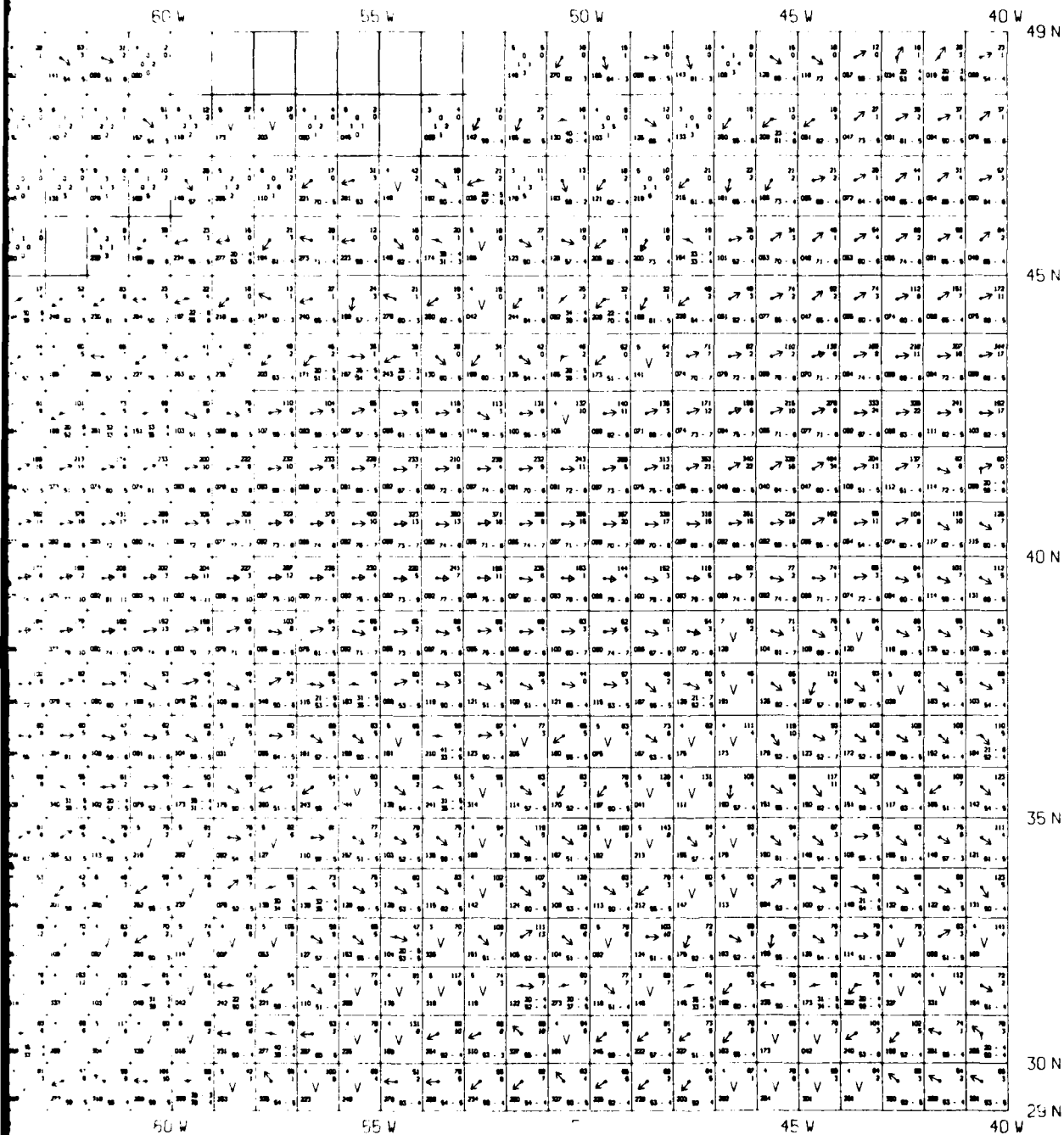
WINTER-JAN, FEB, MAR



2

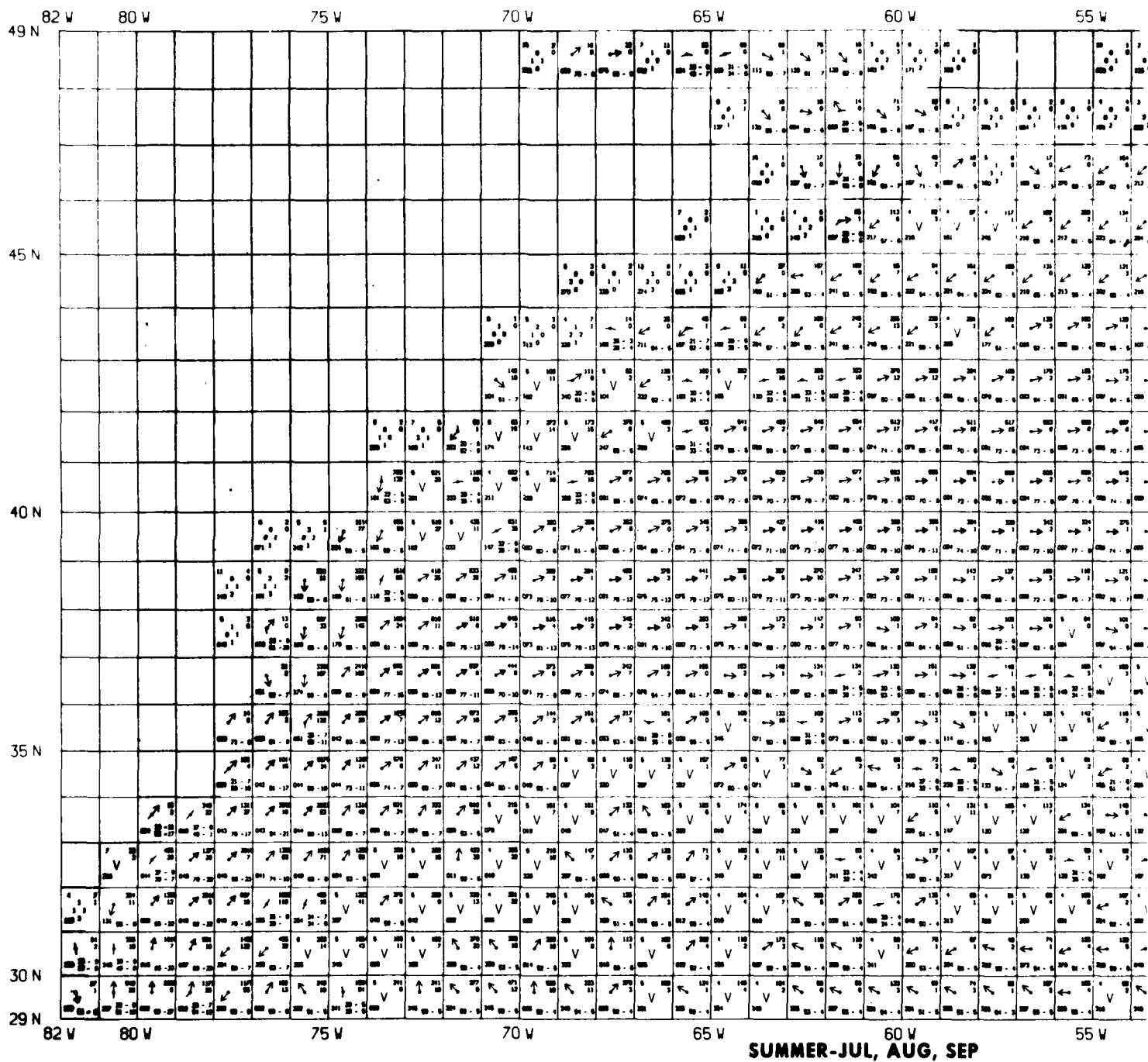


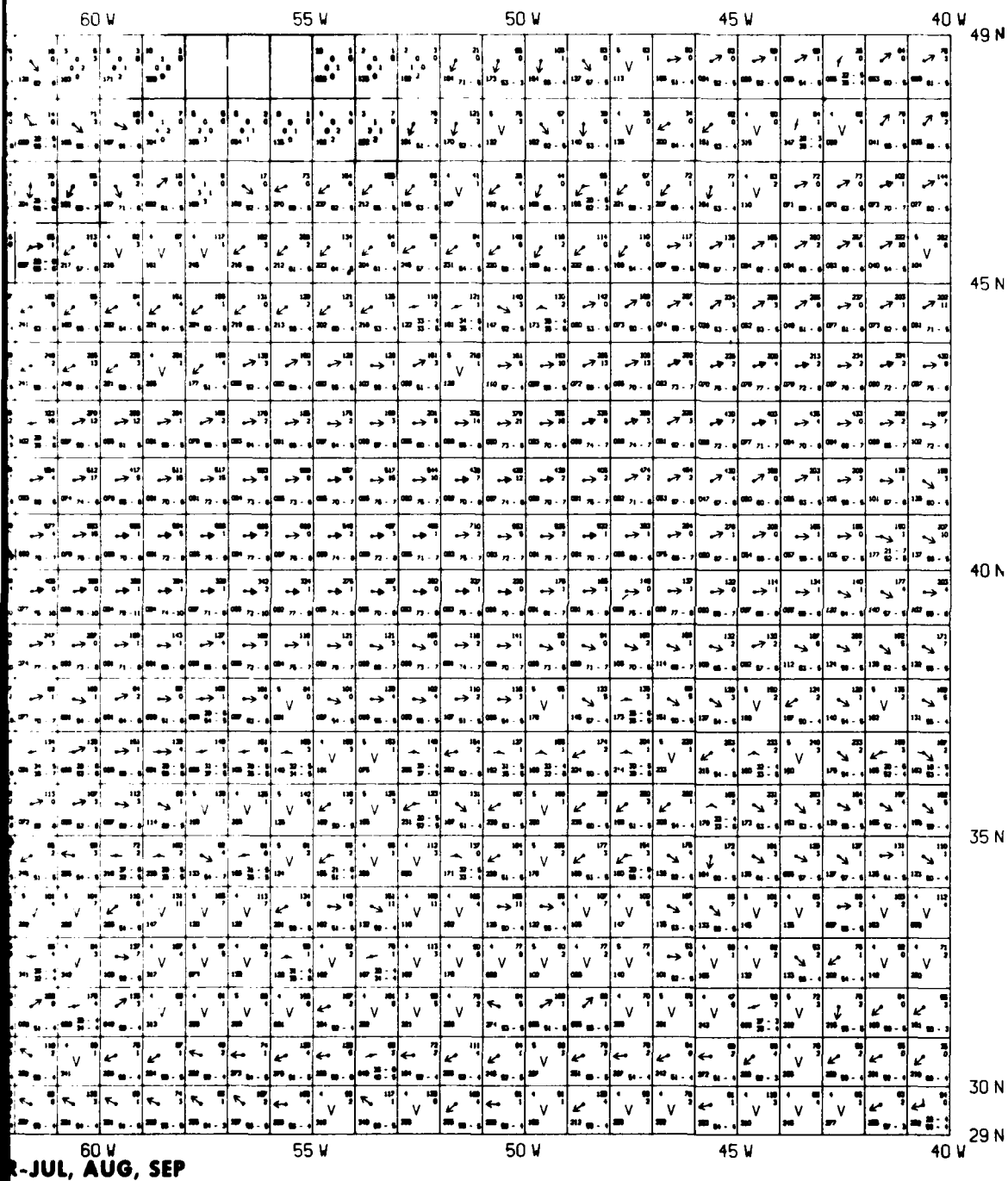
SPRING-APR, MAY, JUN



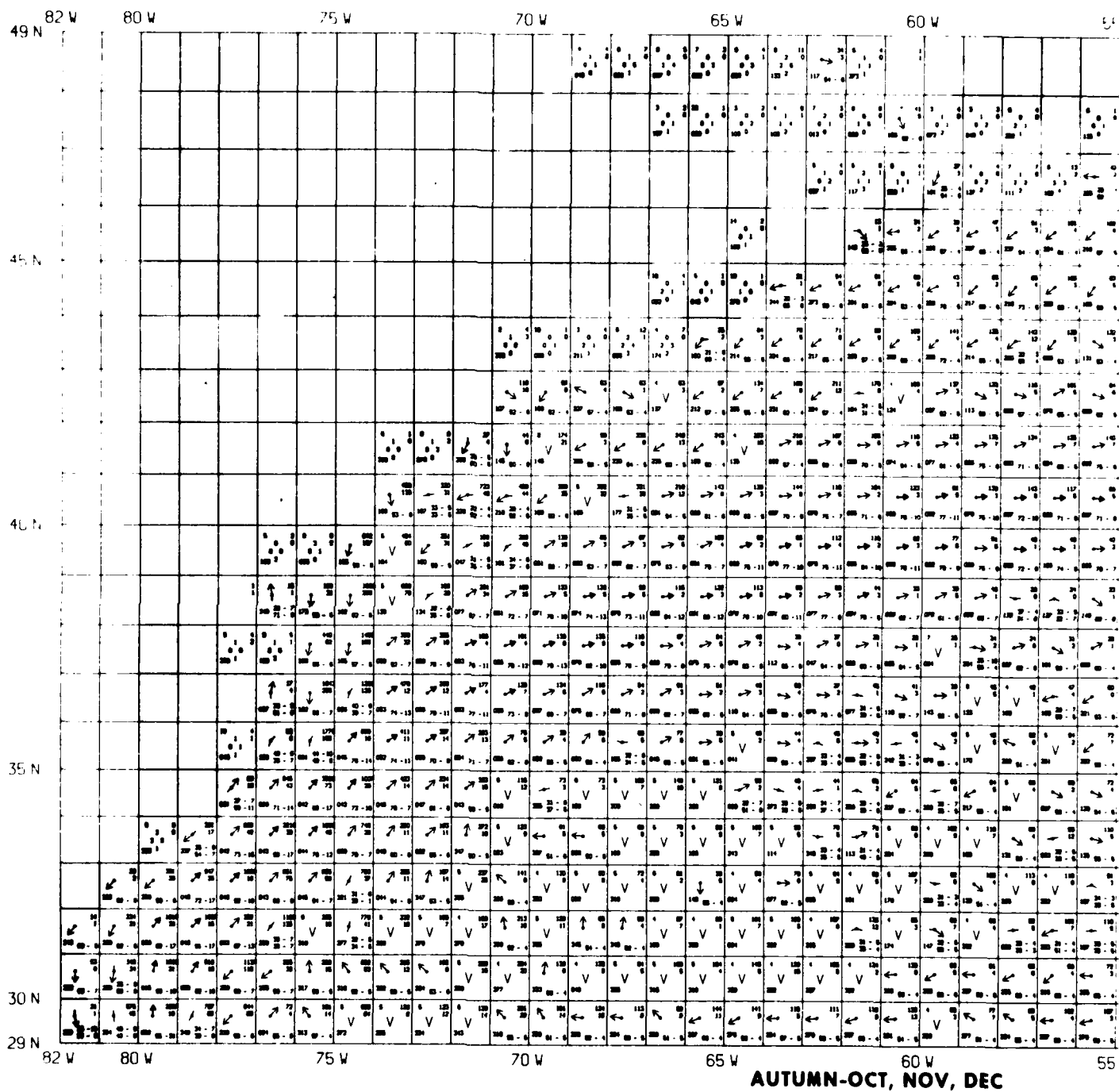
60 W 55 W 50 W 45 W 40 W
49 N
45 N
40 N
35 N
30 N
29 N
60 W 55 W 45 W 40 W
PRING-APR, MAY, JUN

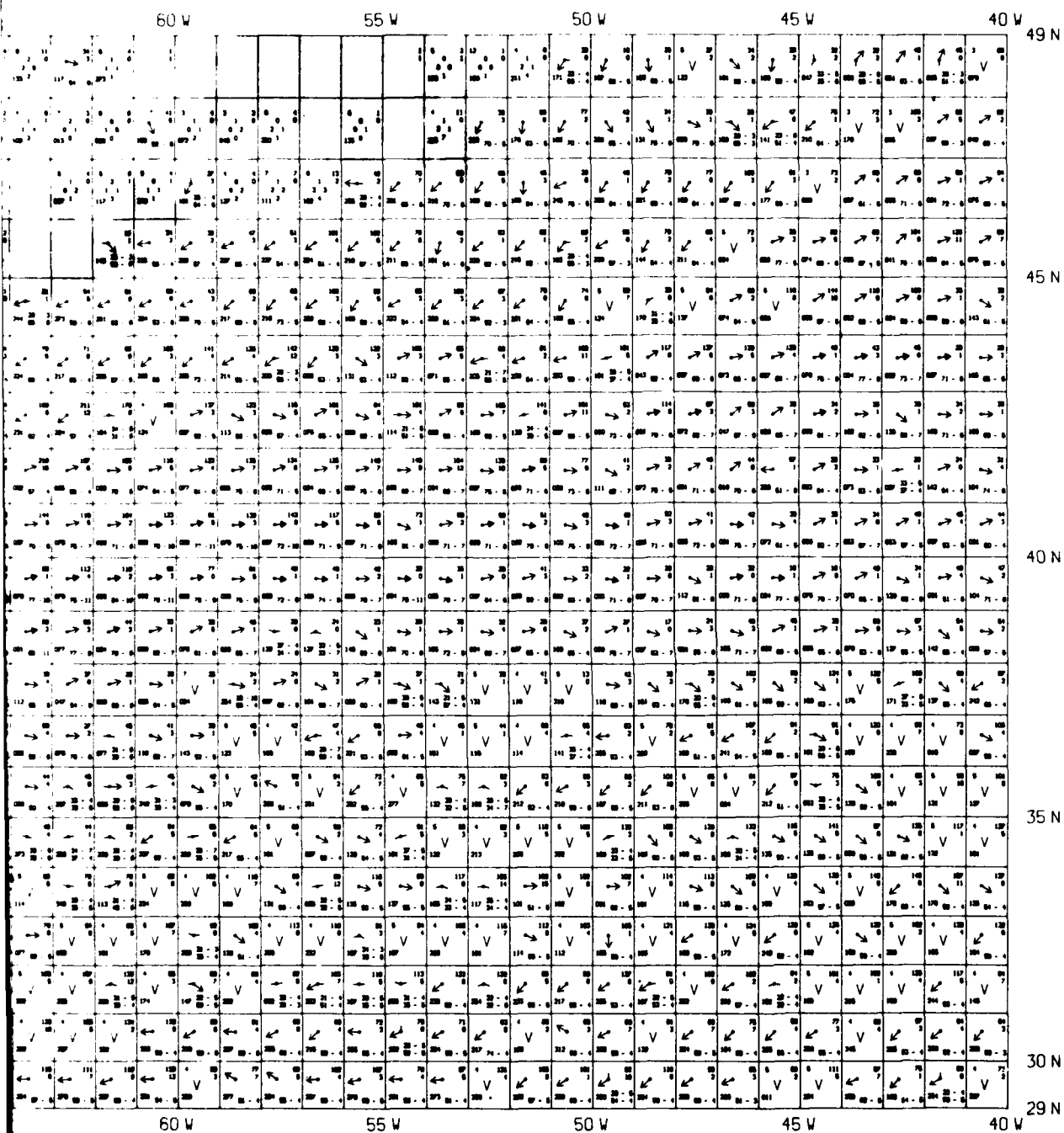
2



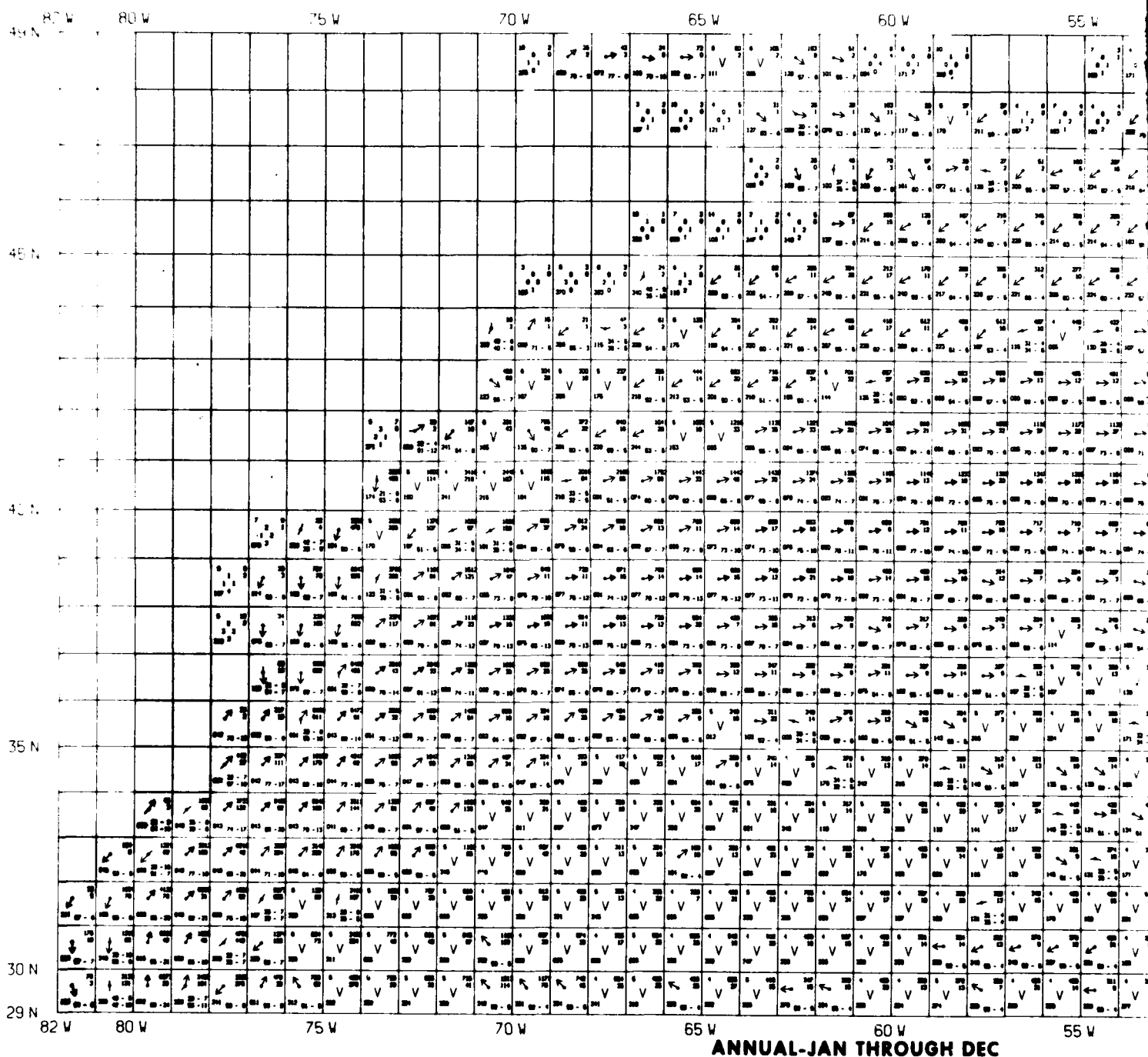


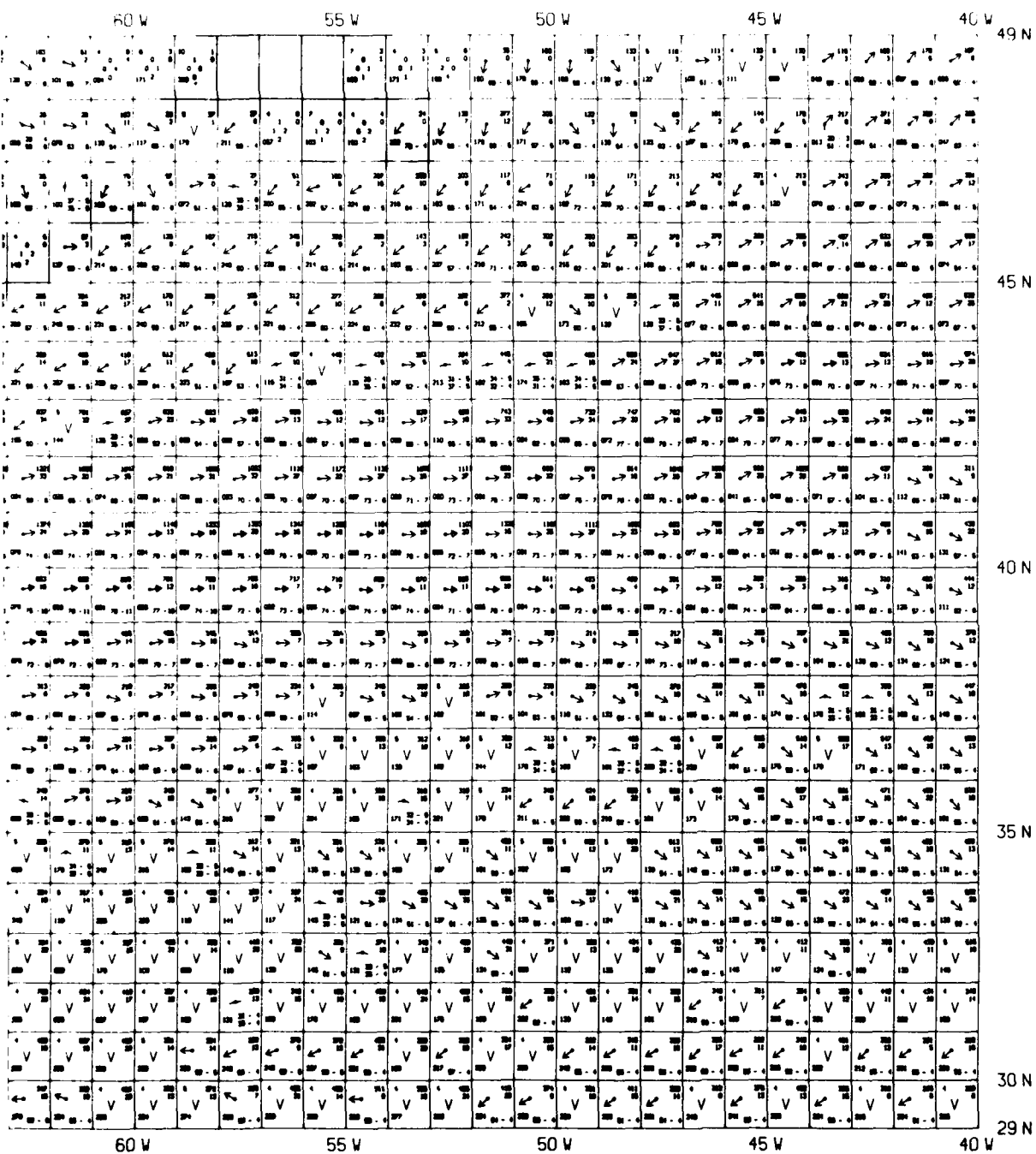
2





2





2

DISTRIBUTION LIST

NAVY

CINCLANTFLT (N37, N353A)
COMSECONDFLT
COMSIXTHFLT
COMNAVICE
COMSUBLANT
COMNAVAIRLANT
COMNAVSURFLANT
COMPATWINGSLANT
DIRNAVOCEANMET
FLENUMWEACEN
FLEWEACEN NORFOLK
FLEWEACEN ROTA
FLEWEAFAC
NAVWEASERVFAC JACKSONVILLE
NWSER BERMUDA
NWSER BRUNSWICK
NWSER CECIL FIELD
NWSER CHARLESTON
NWSER GUANTANAMO BAY
NWSER KEFLAVIK
NWSER LONDON
NWSER MAYPORT
NWSER NAPLES
NWSER PATUXENT RIVER
NWSER ROOSEVELT ROADS
NWSER SIGONELLA
NWSER SOUDA BAY

PRIVATE & UNIVERSITIES

FLORIDA ST. UNIV.
LOUISIANA ST. UNIV.
MASS. INST. OF TECH.
ORE. ST. UNIV.
TEXAS A&M UNIV.
UNIV. OF MIAMI
UNIV. OF R.I.
UNIV. OF WASH.
SCRIPPS INST. OF OCEANOGRAPHY
WOODS HOLE OCEANOGRAPHIC INST.

OTHER GOVT.

NOAA/NODC
NOAA/NCC

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER N00 SP1400-NA6	2. GOVT ACCESSION NO. ADA102094	3. RECIPIENT'S CATALOG NUMBER	
4. TITLE and Subtitle: SURFACE CURRENTS WEST CENTRAL NORTH ATLANTIC OCEAN INCLUDING EAST COAST OF THE UNITED STATES		5. TYPE OF REPORT & PERIOD COVERED Final	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Naval Oceanographic Office NSTL Station Bay St. Louis, MS 39522		8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE February 1978	13. NUMBER OF PAGES 14
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)	
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.			
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Surface Currents West Central North Atlantic Ocean East Coast of the United States			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This atlas, and the series of which it is a part, is computer generated and automatically plotted. It makes available to the user the most recent surface current data collected and will be updated whenever sufficient amounts of data are added to the data file. This and the other atlases are based on a vast quantity of data as compared to the previous manually-compiled editions printed in the mid-thirties.			

SECURITY CLASSIFICATION OF THIS PAGE

20. Cont.

The surface current is the difference between the direction and speed

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 68 IS OBSOLETE
S/N 0102-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. Cont.

The surface current information is based mainly on ship drift, which is the difference between the dead reckoning position and the position determined by any type of navigational aid. This difference describes the direction and speed of the current.

2
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

END

DATE
FILMED

9-81

DTIC